Prep. 3 _ Model (01)

[Q1] A) Choose the correct answer:

(1) If the domain of n (x) = $\frac{x-1}{x-a}$ is R – { 2 }, then a = ...

a) – 2 b) – 1 c) 1 d) 2

(2) If X – Y = 1 , (X – Y)^2 + Y = 1 , then X = ...

a) – 2 b) – 1 c) 1 d) 2

(3) If A is an event in a sample space of a random experiment, and P (A) = 4 P(A$^\backslash$), then P(A) = ...

a) 4 b) 1 c) $\frac{4}{5}$ d) $\frac{1}{4}$

B): By using a general formula and without using calculator, find in R the solution set of the equation **$X^2 - 8X + 3 = 0$**, and $\sqrt{13} \simeq 3.6$

[Q2] A) Choose the correct answer:

(1) The two equations 3 X – 2 Y = 5 , 3 X – 2 Y = K , have infinite number of solutions when k = ...

a) 3 b) 2 c) – 5 d) 5

(2) If X = 1 is one of the set of zeroes of F (X) = X^2 – 3 X + C, then C = ...

a) Zero b) 1 c) 2 d) 3

(3) Which of the following algebraic fractional in the simplest form?

a) $\frac{x+1}{x^2+1}$ b) $\frac{x+1}{x^2-1}$ c) $\frac{x}{x^2}$ d) $\frac{x}{x^2+x}$

B): Find each of $n_1(x) = \frac{2x}{2x+4}$, $n_2(x) = \frac{x^2+2x}{x^2+4x+4}$ in the simplest form showing the domain of each one then show that if $n_1 = n_2$ or not? Give the reason

[Q3]

A) Find in R X R the solution set of two equations:

$$X = 2Y + 3,\ Y^2 - X = 0$$

B) Find in the simplest form and showing its domain:

$$n(x) = \frac{x^2-9}{x^2-x-6} - \frac{x^2-4x}{x^2-2x-8}$$

[Q4]

A) If **n** is an algebraic fractional function where $n(x) = \frac{2+b}{x+4}$, find the domain of **n**. If n (5) = 1 **find** the value of expression: 2 b – 11

B) A bag contains **20** cards numbered from **1** to **20**, on card is chosen randomly, **find** the probability of chosen card has a number:

① Divisible by **3** ② Odd and divisible by **5**

[Q5]

A) Find algebraically the solution set of two equations:

$$X + Y - 5 = 0,\ 3X + Y = 17$$

B) Find in the simplest form: $\mathbf{n(X)} = \frac{x^2-3x+2}{x^2+x-6} \times \frac{x^2+2x}{x^2+x-2}$

And show its domain, and then find if possible the value of **n (1)**

••• *End of the questions* •••

Prep. 3 _ Model (02)

[Q1] A) Choose the correct answer:

(1) The set of zeroes of $F(x) = X + 3$ is ....

a) R b) R – {3} c) { 3 } d) 3

(2) The two straight line X = 4 , Y = 3 intersecting at point ....

a) (4 , 3) b) (0 , 0) c) (3 , 4) d) (– 3 , – 4)

(3) If X , Y are two mutually exclusive events in the sample space of a random experiment, then $P(X \cap Y)$ = ...

a) $\varnothing$ b) Zero c) { } d) 1

B): find the solution set of two equations:

$$X - Y = 0 \quad , \quad XY = 4$$

[Q2] A) Choose the correct answer:

(1) The two first degree equations in one variable which have infinite solution are represented graphically with two straight lines are................

a) Parallel b) Interest at one point c) Congruent d) Disjoint

(2) If $F(x) = \frac{7+X}{7-X}$, where $x \in R - \{7, -7\}$, then $F(-2)$ = ...

a) $\frac{-1}{f(-2)}$ b) $\frac{-1}{f(2)}$ c) $\frac{1}{f(2)}$ d) $\frac{1}{f(-2)}$

(3) If the domain of function n where $n(x) = \frac{x-2}{x^2+K}$ is R

Then K .... zero

a) = b) < c) > d) $\leq$

B): A rectangle with a length is more than their widths by 5 cm. if the perimeter of the rectangle is 18 cm, find the area of rectangle

[Q3]

A) Find **n (x)** in the simplest form showing its domain:

$$n(x) = \frac{x^2-3x+2}{x^2-1} \times \frac{3x-15}{x^2-4x-5}$$

B) By using a general formula and without using calculator, find in R the solution set of the equation $X + \frac{1}{X} = 5$, approximating the result to two decimal places. and $\sqrt{17} \simeq 4.12$

[Q4]

A) Find n (x) in the simplest form showing its domain:

$$n(x) = \frac{x^2+x+1}{x^3-1} \div \frac{x^2-x}{x^2-2x+1}$$

B) Find in the simplest form: $n(X) = \frac{x^2-9}{x^2-x-6} + \frac{4x-x^2}{x^2-2x-8}$

And show its domain, and then find if possible the value of **n (3)**

[Q5]

A) If A , B are two events of the sample space of a random experiment, and $P(A) = \frac{1}{2}$, $P(B) = \frac{2}{5}$, $P(A \cap B) = \frac{1}{10}$, Find

① $P(A \cup B)$ ② $P(B - A)$

B) If n_1, n_2 are two functions, Prove that $n_1 = n_2$ where

$$n_1(x) = \frac{x^2+5x}{x^2+10x+25}, \quad n_2(x) = \frac{2x}{2x+10}$$

••• End of the questions •••

Prep. 3 _ Model (03)

[Q1] A) Choose the correct answer:

(1) The intersection point of two lines X + 2 = 0 , Y = X is ....

a) (2 , 2) b) (2 , 0) c) (− 2 , − 2) d) (0 , 0)

(2) If n(x) = $\frac{x+1}{x-2}$ is an algebraic fraction, then the domain in which it has a multiplicative inverse is ....

a) R − {2} b) R − {− 1 , 2 } c) R − {−1} d) {−1,2}

(3) If the two equations X + 2 Y = 1 , X + K Y = 2 have a one solution in R × R, the K ≠ ....

a) 2 b) 4 c) −2 d) −4

B): By using a general formula and without using calculator, find in **R** the solution set of the equation **X (X − 3) = −1**, approximating the result to one decimal place

---

[Q2] A) Choose the correct answer:

(1) If the curve of quadratic function passing through the points (2,0) , (−3,0) , (0,−6), then the solution set of **F (x) = 0** in **R** is .....

a) {−2,3} b) {3,2} c) {2,−3} d) {−3,−6}

(2) The simplest form of n (x) = $\frac{3-X}{X-3}$ where X ∈ R − {3} is ....

a) 1 b) −1 c) 3 d) −3

(3) If A is an event in sample space of a random experiment, then P(A) = ...

a) 1 b) −1 c) 1 − P(A) d) P(A) − 1

B): If (a , 2 b) is a solution in R of two equations 3 X − Y = 5 , X + Y = −1.

Find the value of a , b

[Q3]

A) n_1 , n_2 are two algebraic fractions where $n_1(x) = \frac{x^2-4}{x^2+x-6}$, $n_2(x) = \frac{x^2-x-6}{x^2-9}$ prove that $n_1(x) = n_2(x)$ for all the values of X which belongs to the common domain and find this domain

B) Find in R × R the solution set of two equations

$$X + Y = 3 , X^2 + XY = 6$$

[Q4]

A) Find in the simplest form: $\mathbf{n(X)} = \frac{x^2+3x}{x^2+2x-3} - \frac{x-2}{x^2-3x+2}$

And showing its domain

B) Find in the simplest form and showing its domain:

$\mathbf{n(X)} = \frac{x^3-x^2-2x}{x^2-5x+6} \times \frac{x^2+2x-15}{x^3+6x^2+5x}$ then find n(7) , n (3) if possible

[Q5]

A) If $n_1(x) = \frac{x-a}{x+b}$, and set of zeroes of $n_1(x)$ is {5} and domain of $n_1(x)$ is R – {3}, find the value of a , b.

If $n_2(x) = \frac{x-1}{x-3}$ **find** $n_1(x) + n_2(x)$ in the simplest form

B) If A , B are two events of the sample space of a random experiment, and P (A) = **0.7** , P (B) = **0.6** , P (A ∩ B) =**0.4** , Find

① P (A ∪ B)

② The occurrence of one of the two events but not the other

••• *End of the questions* •••

Prep. 3 _ Model (04)

[Q1] A) Choose the correct answer:

(1) The solution set of the equation $X^2 + 4 = 0$ in R is ....

a) $\varnothing$ b) {2} c) {−2} d) { 2 , − 2 }

(2) If $a^2 - b^2 = 6$, $a - b = \sqrt{3}$, then $(a + b)^2$ = ...

a) $2\sqrt{3}$ b) $3\sqrt{3}$ c) $\sqrt{3}$ d) 12

(3) If A , B are two mutually exclusive events, then P (A ∩ B) = ...

a) Zero b) $\varnothing$ c) $\frac{1}{6}$ d) 1

B): By using a general formula and without using calculator, find in **R** the solution set of the equation $\mathbf{X^2 + 2X - 1 = 0}$, approximating the result to one decimal place.

[Q2] A) Choose the correct answer:

(1) The set of zeroes of F (x) = − 3 x is ....

a) $\varnothing$ b) { 0 } c) { 3 } d) R − { 3 }

(2) The simplest form of n (x) = $\frac{3-X}{X-3}$ where X ≠ 3 is ....

a) 1 b) −1 c) 3 d) −3

(3) If the domain of n (x) = $\frac{x+1}{x^2-k\,x+4}$ is R − {2} , then K = ...

a) 2 b) − 2 c) 4 d) − 4

B): If n (x) = $\frac{x^2 + 3x}{x^3 + 27}$

Find n^{-1} (x) in the simplest form showing the domain of n^{-1} (x)

[Q3]

A) Find in the simplest form: **n (X)** = $\frac{x^2-2x+1}{x^3-1} \div \frac{x-1}{x^2+x+1}$

And showing its domain

B) Find in **R** × **R** the solution set of two equations

$$Y - X = 2 \ , \ X^2 + XY = 4$$

[Q4]

A) If A , B are two events of the sample space of a random experiment,

and P (A) = $\frac{1}{4}$, P (B) = $\frac{2}{3}$, Find P (A ∪ B)if :

① P (A ∩ B) = $\frac{1}{6}$

② A ⊂ B

B) Find in **R** × **R** the solution set of two equations

$$X = Y + 4 \quad , \quad 3X + 4Y = 5$$

[Q5]

A) If $n_1(x) = \frac{x^2}{x^3-3x^2}$, $n_2(x) = \frac{x}{x^2-3x}$

Prove that $\mathbf{n_1 = n_2}$

B) Find in the simplest form: **n (X)** = $\frac{3x-6}{x^2-4} - \frac{9}{2-x-x^2}$

And showing its domain

••• End of the questions •••

Prep. 3 _ Model (05)

[Q1] A) Choose the correct answer:

(1) The solution set of two equations X – 3 = 0 , Y = 4 in R × R is ....

a) { 3 , 4 } b) {(3,4)} c) {(4,3)} d) ∅

(2) If A , B are two events in sample space of a random experiment, A ⊂ B, then P (A ∪ B) = ...

a) P (B) b) P (A) c) P (A ∩ B) d) Zero

(3) If $3^Y \times 5^Y = 225$, then Y = ...

a) 2 b) 15 c) Zero d) 20

B):

Find in R × R the solution set of two equations:

$$3X - Y = 5 \quad , X + 2Y = 4$$

[Q2] A) Choose the correct answer:

(1) The domain of the addative inverse of $n(x) = \frac{x+2}{x-3}$

a) R – {3} b) R – {–2} c) R –{–2,3} d) R

(2) The set of zeroes of $F(x) = X^2 + 9$ in R is ....

a) R b) ∅ c) { 3 } d) { 3 , –3}

(3) The curve $Y = aX^2 + bx + C$ cut Y-axis at the point ....

a) (0 , b) b) (b , 0) c) (c , 0) d) (0 , 7)

B):

Find in the simplest form: **n (X)** = $\frac{x^2+x}{x^2-1} - \frac{5-x}{x^2-x+5}$

And showing its domain

[Q3]

A) If A , B are two events of the sample space of a random experiment, and P (A) = **0.6** , P (B) = **0.5** , P (A ∩ B) =**0.3** , Find

① P (A ∪ B)

② P (B\`)

B) Find in the simplest form: **n (X)** = $\frac{x^3-1}{x^2-2x+1} - \frac{2x-2}{x^2+x+1}$

And showing its domain

[Q4]

A) Prove that $n_1(x) = n_2$

Where $n_1(x) = \frac{x^2-x}{x^3-2x^2}$, $n_2(x) = \frac{x^2-3x+2}{x^3-4x^2+4x}$

B) By using a general formula and without using calculator, find in **R** the solution set of the equation $2X^2 + 4X + 1 = 0$, approximating the result into two decimal places.

[Q5]

A) Find the solution set of two equations in R × R

$$X - Y = 0 \qquad , X = \frac{4}{y}$$

B) If **n (X)** = $\frac{x^2-2x}{(x-2)(x^2+2)}$ Find:

① $n^{-1}(x)$ showing its domain

② If $n^{-1}(x) = 3$, find the value of X.

••• *End of the questions* •••

Prep. 3 _ Model (06)

[Q1] A) Choose the correct answer:

(1) If the two equations $X - 3Y = 5$, $2X + KY = 10$ have infinite number of solution, then K = ...

a) 10 b) 6 c) -6 d) 3

(2) If $F(x) = X^3 - m$, $Z(F) = \{3\}$, then m = ...

a) 9 b) 27 c) 3 d) $\sqrt[3]{3}$

(3) If $AB = 3$, $AB^2 = 9$, then A^2B = ...

a) 3 b) 9 c) $\frac{1}{3}$ d) $\frac{1}{9}$

B): Find n (x) in the simplest form showing its domain

$$n(x) = \frac{x^2 - 12x + 36}{x^2 - 6x} \div \frac{36 - x^2}{4x + 24}$$

[Q2] A) Choose the correct answer:

(1) If the probability that a student in exam is succeeded = $\frac{4}{5}$, then the probability his failed is ....

a) 10 % b) 20 % c) Zero d) 1

(2) If the domain of $F(x) = \frac{1}{x} - \frac{5}{x+k}$ is $R - \{0, 3\}$, then K = ...

a) 3 b) 6 c) 5 d) -3

(3) If X is a negative number, then the greatest one of the following is ....

a) $7X$ b) $7 + X$ c) $7 - X$ d) $\frac{7}{x}$

B): If the perimeter of rectangle is **14** cm, and its area is **12** cm^2. Find the length of its dimensions.

[Q3]

A) If $n_1(x) = \frac{x-1}{x}$, $n_2(x) = \frac{x^2-1}{x^2+x}$

Show that if $n_1 = n_2$ or not? Give reason

B) If A , B are two events of the sample space of a random experiment, and P (A) = **0.3** , P (B) = **m** , P (A ∪ B) =**0.7** , Find the value of m if:

① P (A ∩ B) = 0.2

② A , B are two mutually exclusive events

[Q4]

A) If $n(x) = \frac{x^2-5x}{(x-5)(x^2+1)}$

① Find $n^{-1}(x)$ showing its domain

② If $n^{-1}(x) = 2$, find the value of X

B) A point moves on the straight line **5 X – 2 Y = 1** where its Y-coordinate is twice the square of its X-coordinate. Find the coordinate of this point

[Q5]

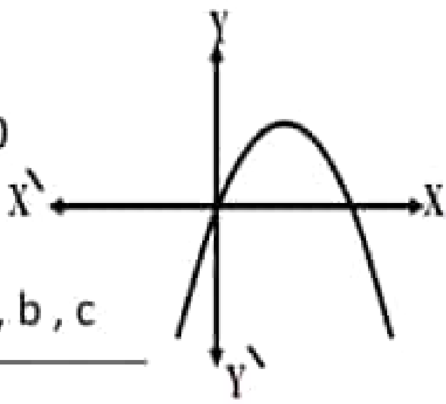
A) In the opposite figure:

The curve represents $F(x) = a X^2 + b x + c$, $a \neq 0$

If the curve passes through point (0 , 0)

And the equation of line of symmetry X = 2

And the maximum value Y = 2. Find value of a , b , c



B) Find n (x) in the simplest form showing its domain

$$n(x) = \frac{x^3+x^2-2}{x-1} - \frac{2x-2}{1-x}$$

••• *End of the questions* •••

Prep. 3 _ Model (07)

[Q1] A) Choose the correct answer:

(1) If the two equations X + 2 Y = 1 , 2 X + K Y = 2 have one solution, the K ≠ ....

a) 1 b) 2 c) 4 d) − 4

(2) If the domain of $n_1(x) = \frac{5}{x-8}$ equal the domain of $n_2(x) = \frac{x-3}{x+k}$, then K = ...

a) 8 b) − 8 c) 24 d) − 3

(3) Twice a number formed from two digits, its units Y and tens X is

a) 2 Y + 10 X b) 2 Y + 20 X c) 2 X + 10 Y d) 2 x + 20 Y

B): By using a general formula and without using calculator, find in R the solution set of the equation $\frac{5}{x^2} - \frac{2}{x} = 1$, and $\sqrt{6} \simeq 2.45$

[Q2] A) Choose the correct answer:

(1) A bag contains **20** cards numbered from **1** to **20**, on card is chosen randomly, the probability of chosen card has a number Divisible by **2** and **3** together = ...

a) $\frac{1}{2}$ b) $\frac{6}{20}$ c) $\frac{3}{20}$ d) $\frac{13}{20}$

(2) The set of zeroes of $F(x) = \frac{x^2-x+2}{x^2-4}$ in R is ....

a) { 2 } b) { − 1 } c) { − 1 , 2 } d) { − 2 , 2 }

(3) If $X^2 + Y^2 = 2XY$, then X − Y = ...

a) $\sqrt{2XY}$ b) $\sqrt{2}$ c) Zero d) ± 1

B):

If the domain of $F(x) = \frac{b}{x} + \frac{9}{x+a}$ is R − { 0 , 4 } and F (5) = 2, find the value of a , b

[Q3]

A) Prove that $n_1(x) = n_2(x)$ for all values of X which belongs to the common domain and find this domain.

Where $n_1(x) = \frac{x^2-4}{x^2+x-6}$, $n_2(x) = \frac{x^3-x^2-6x}{x^3-9x}$

B) If A , B are two events of the sample space of a random experiment,

and $P(A \cap B) = \mathbf{0.2}$, $P(A - B) = \mathbf{0.3}$, $P(B - A) = \mathbf{0.4}$, Find

① $P(B)$ ② $P(A \cup B)$

[Q4]

A) Find in the simplest form: **n (X)** = $\frac{x^2+3x+9}{x^3-27} + \frac{x^2-x-12}{9-x^2}$

And showing its domain

B) If (1 , 2) is a solution of two equations, find the value of a , b

Where **a X + b Y + 5 = 0 , 2 a X + b Y − 2 = 0**

[Q5]

A) If $n(x) = \frac{x^2-3x}{x^2-5x+6}$ Find:

① $n^{-1}(x)$ in simplest form and showing its domain

② If $n^{-1}(x) = 2$, find the value of X.

B) Find in the simplest form: **n (X)** = $\frac{x^2+2x-3}{x^2+5x+6} \div \frac{x^2+x-2}{x^2-4}$

And showing its domain then find the value of X when n (x) = 3

••• End of the questions •••

Prep. 3 _ Model (08)

[Q1] A) Choose the correct answer:

(1) If $X = -3$ is a solution of equation $X^2 + mX - 9 = 0$, then m = ...

a) 3 b) -3 c) Zero d) -9

(2) The domain of addative inverse of $n(x) = \frac{x}{x-3}$ is ....

a) R b) $R - \{0\}$ c) $R - \{3\}$ d) $R - \{0, 3\}$

(3) Number of solution of two equations $X - \frac{1}{2}Y = 4$, $2X - Y = 2$ in R^2 is .... solution

a) One b) Two c) Infinite d) Zero

B): By using a general formula and without using calculator, find in **R** the solution set of the equation $X + \frac{4}{X} = 6$, approximating the result into three decimal places.

[Q2] A) Choose the correct answer:

(1) If A is an event in sample space of a random experiment, and $P(A) = 4P(A^\backslash)$, then P (A) ....

a) 0.8 b) 0.6 c) 0.4 d) 0.2

(2) If the set of zeroes of F : $F(x) = aX + 6$ is $\{-2\}$, then a = ...

a) 3 b) 2 c) -2 d) -3

(3) If $Y = 1 - X$, $(X + Y)^2 + Y = 5$, then Y = ...

a) 5 b) 4 c) 3 d) -4

B):

The area of rectangle is **77** cm^2, if its length decrease by **2** cm and the width increase by **2** cm it will be square, find the area of the square.

[Q3]

A) If the domain of F : $F(x) = \frac{x}{x^2 - 5x + m}$ is R – { 2 , c }

Find the value of m , c

B) If A , B are two events of the sample space of a random experiment, and $P(B) = \frac{1}{3}$, $P(A - B) = \frac{1}{4}$, Find P (A) if ....

① $P(A \cap B) = \frac{1}{12}$ ② $B \subset A$

[Q4]

A) If **n (X) =** $\frac{x^2 - 2x}{x^4 + 3x^3 + 2x^2} - \frac{4 - x^2}{x^2 + x - 2}$

① Find n (x) in the simplest form showing its domain
② Find the solution set of n (x) = 0

B) If **F (x) = a** X^2 **+ b** and F (1) = 5 , F (2) = 11

Find the value F (4)

[Q5]

A) Prove that $n_1(x) = n_2(x)$ for all values of X which belongs to the common domain and find this domain.

Where $n_1(x) = \frac{x^2 + x - 12}{x^2 + 5x + 4}$, $n_2(x) = \frac{x^2 - 2x - 3}{x^2 + 2x + 1}$

B) Find in the simplest form: **n (X) =** $\frac{x^2 - 2x - 15}{x^2 - 9} \div \frac{x^2 - 25}{x^2 - 3x}$

And show its domain, and then find the value of **a** if n (a) = $\frac{1}{3}$

••• *End of the questions* •••

Prep. 3 _ Model (09)

[Q1] A) Choose the correct answer:

(1) The two straight line 3 X + 5 Y = 0 , 5 X – 3 Y = 0 intersecting at ....

a) Origin point b) First quad. c) Second quad. d) Fourth quad.

(2) The addative inverse of the fraction $\frac{x+7}{x-5}$ is ....

a) $\frac{7-x}{x+5}$ b) $\frac{x+7}{5-x}$ c) $\frac{-(x+7)}{5-x}$ d) $\frac{x-7}{5-x}$

(3) If A is an event in a sample space of a random experiment, and 2 P (A) = 3 P(A$^{\backslash}$), then P(A) = ...

a) 0.8 b) 0.6 c) 0.4 d) 0.2

B): By using a general formula and without using calculator, find in **R** the solution set of the equation $\frac{1}{x} + \frac{8}{x^2} = 1$, approximating the result into three decimal places.

[Q2] A) Choose the correct answer:

(1) In the equation a X^2 + b X + C = 0, if $b^2 - 4ac < 0$, then the number of roots of the equation in R is ....

a) 1 b) 2 c) Zero d) Infinite

(2) If n (x) = $\frac{x-1}{x+2}$, then n^{-1} (4) = ...

a) – 1 b) Zero c) 3 d) Undefined

(3) If $X^2 - Y^2 = 6$, X – Y = $\sqrt{3}$, then $(X + Y)^2$ = ...

a) $2\sqrt{3}$ b) $3\sqrt{3}$ c) $\sqrt{3}$ d) 12

B):

If the length of diagonal in a rectangle is **5** cm, and its perimeter is **14** cm. find its area?

[Q3]

A) If the set of zeroes of F:F(x) = $\frac{a\,x^2-6\,x+8}{b\,x-4}$ is {4}, and its domain is R − {2}, find the value of a , b.

B) If A , B are two events of the sample space of a random experiment, and P (A) = $\frac{2}{5}$, P (A ∪ B) = $\frac{4}{5}$, P (B) + 7 P (A∩B) = 2

Find ① P (B) ② P (B − A)

[Q4]

A) If **n (X) =** $\frac{x^2-4}{x^2+x-2} + \frac{5-10\,x}{3\,x-1-2x^2}$

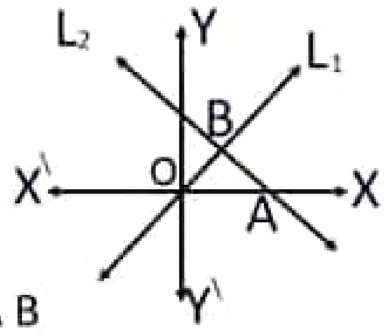
Find n(x) in the simplest form showing its domain

B) In the opposite figure:

If the equation of Straight line L_1 is **Y = 2 X,**

And equation of L_2 is **X + Y = 6** where $L_1 \cap L_2$ = {b}

O is origin point, A ∈ $\overleftrightarrow{XX^{\backslash}}$. Find the area of Δ O A B



[Q5]

A) Prove that **n_1(x) = n_2 (x)**

Where $n_1(x) = \frac{x^2-x}{x^3-2\,x^2}$, $n_2(x) = \frac{x^2-3\,x+2}{x^3-4\,x^2+4\,x}$

B) Find in the simplest form: **n (X) =** $\frac{x^2+x-6}{x^2+5\,x+6} \div \frac{x^3-2\,x^2+\,x-2}{x^3+2\,x^2+\,x+2}$

And show its domain.

••• End of the questions •••

Prep. 3 _ Model (10)

[Q1] A) Choose the correct answer:

(1) If the two equations **X + 4 Y = m , 3 X + K Y = 21** have infinite number of solution in R × R, then K + m = ...

a) 19 b) 20 c) 21 d) 22

(2) The common domain of two fractions $\frac{2}{x^2-1}$, $\frac{5x}{x^2-x}$ is ....

a) R − {1} b) R − {0,1} c) R − {−1,1} d) R − {0,−1,1}

(3) If a coin is throwing once, the probability of appear a tail is ....

a) 100 % b) 50 % c) 25 % d) Zero

B): By using a general formula and without using calculator, find in R the solution set of the equation $\frac{x^2}{9} + \frac{4}{3}$ **X = − 2** , approximating the result into three decimal places.

[Q2] A) Choose the correct answer:

(1) If the solution set of the equation $4X^2 + 4X + C = 0$ in R is $\{-\frac{1}{2}\}$ then the value of C = ...

a) 2 b) 1 c) − 1 d) − 8

(2) If $n(x) = \frac{x^2-x}{x^2-1}$, $n^{-1}(K) = 3$, then K = ...

a) $-\frac{1}{2}$ b) $\frac{1}{2}$ c) $\frac{3}{4}$ d) $1\frac{1}{3}$

(3) If domain of $F(x) = \frac{x+b}{x+a}$ is R − { − 2 } , and F(0) = 3, then a + b=.......

a) 2 b) 6 c) 8 d) 10

B):

Find in R × R the solution set of two equations

$$X + Y = 2 \ , \ \frac{1}{x} + \frac{1}{y} = 2 \text{ where } X \neq 0 , Y \neq 0$$

[Q3]

A) If $n_1(x) = \frac{x}{x+a}$, $n_2(x) = \frac{x^3+bx}{x^3+ax^2+x+5}$ and $n_1 = n_2$. Find the value of a , b

B) If A , B are two events of the sample space of a random experiment, and P (A) = **0.6** , P (B) = **0.7** , P (A ∩B) = **0.4**

Find ① The probability of non-occurrence of A , B together.

② The probability of occurrence at least one of them.

[Q4]

A) Find in the simplest form: **n (X)** = $\frac{x-6}{2x^2-15x+18} + \frac{x-5}{15-13x+2x^2}$

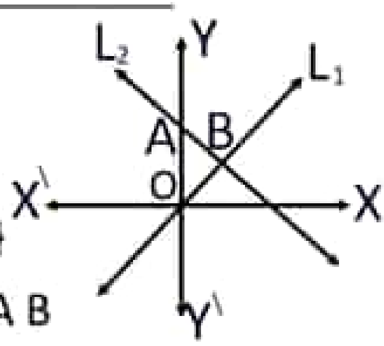
And show its domain,

B) In the opposite figure:

If the equation of Straight line L_1 is **Y = 3 X**,

And equation of L_2 is **X + Y = 8** where $L_1 \cap L_2 = \{b\}$

O is origin point, A ∈ $\overleftrightarrow{YY'}$. **Find** the area of Δ O A B



[Q5]

A) Find in the simplest form: **n (X)** = $\frac{x^2-2x-15}{x^2-9} \div \frac{2x-10}{x^2-6x+9}$

And show its domain.

B) If **n (x) = a X – 3 , F (x) = a^2X^2 – 12 X + 9** and Z (n) = Z (f)

Find the value of **a** and Z (F).

••• End of the questions •••

1 Giza Governorate

Answer the following questions :

1 Choose the correct answer :

(1) The set of zeroes of the function f : where $f(X) = -3X$ is ....

(a) $\{0\}$ (b) $\{3\}$ (c) $\{-3\}$ (d) $\mathbb{R} - \{3\}$

(2) If $A \subset S$ of a random experiment , $P(A) = P(\acute{A})$, then $P(A) =$ ....

(a) 1 (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{1}{8}$

(3) If X is a negative number, then the greatest number of the following is ....

(a) $5X$ (b) $\frac{5}{X}$ (c) $5 + X$ (d) $5 - X$

(4) The domain of the function $f : f(X) = \frac{X-3}{4}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{-4\}$ (c) $\mathbb{R} - \{-4, 3\}$ (d) $\varnothing$

(5) If the sum of ages of a father and his sun now is 47 years , then the sum of their ages after 10 years = ... years.

(a) 27 (b) 37 (c) 57 (d) 67

(6) If the two equations $X + 2y = 1$, $2X + ky = 2$ has only one solution , then $k \neq$ ....

(a) 1 (b) 2 (c) 4 (d) -4

2 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two following equations algebraically :**

$X + 3y = 7$, $5X - y = 3$

[b] Find n (X) in its simplest form , showing the domain of n :

$$n(X) = \frac{X^2 + X}{X^2 - 1} - \frac{X + 5}{X^2 + 4X - 5}$$

3 **[a] Find in $\mathbb{R}$ the solution set of the following equation by using the general rule :**

$X^2 - 4X + 1 = 0$ rounding the results to two decimal places.

[b] If $n_1(X) = \frac{2X}{2X + 6}$, $n_2(X) = \frac{X^2 + 3X}{X^2 + 6X + 9}$ **, then prove that :** $n_1 = n_2$

4 [a] If A and B are two events from a sample space of a random experiment , and

$P(A) = 0.7$, $P(B) = 0.6$, $P(A \cap B) = 0.4$, **then find :**

(1) $P(A \cup B)$ (2) $P(A - B)$

[b] **Find** $n(X)$ **in its simplest form , showing the domain of n :**

$$n(X) = \frac{X^3 - 8}{X^2 - 3X + 2} \times \frac{X + 1}{X^2 + 2X + 4}$$

---

5 [a] **Find in** $\mathbb{R} \times \mathbb{R}$ **the solution set of the two following equations :**

$X - y = 1$, $X^2 - y^2 = 25$

[b] If $n(X) = \frac{X^2 - 3X}{(X - 3)(X^2 + 2)}$

, then find : $n^{-1}(X)$ in the simplest form , showing the domain of n^{-1} .

2 Alexandria Governorate

Answer the following questions :

1 **Choose the correct answer from those given ones :**

(1) If A , B are two mutually exclusive events , $P(B) = 0.5$ and $P(A \cup B) = 0.7$

, then $P(A) =$ ....

(a) 0.02 (b) 0.2 (c) 0.5 (d) 0.13

(2) $(X + 1)^2 =$ ....

(a) $X^2 + 1$ (b) $X^2 - 1$ (c) $X^2 - X + 1$ (d) $X^2 + 2X + 1$

(3) The additive inverse of the fraction $\frac{3}{X^2 + 1}$ is ....

(a) $\frac{-3}{X^2 + 1}$ (b) $\frac{X^2 + 1}{3}$ (c) $\frac{X^2 + 1}{-3}$ (d) $\frac{3}{X^2 - 1}$

(4) If X is a negative real number , then the greatest number of the following numbers is ....

(a) $3 + X$ (b) $3X$ (c) $3 - X$ (d) $\frac{3}{X}$

(5) If $X = 2$ and $y = 3$, then $(y - 2X)^{10} =$ ....

(a) 10 (b) -1 (c) -10 (d) 1

(6) The point of intersection of the two straight lines $X = 2$ and $X + y = 6$ is ....

(a) (2 , 6) (b) (2 , 4) (c) (4 , 2) (d) (6 , 2)

2 [a] If A and B are two events of the sample space (S) of a random experiment such that :

$P(A) = 0.7$, $P(A \cap B) = 0.3$ **Find :** $P(A - B)$

[b] Find n (X) in the simplest form showing the domain of n , where :

$$n(X) = \frac{X^2 + 2X + 4}{X^3 - 8} - \frac{9 - X^2}{X^2 + X - 6}$$

---

3 **[a] Find the common domain of n_1 , n_2 to be equal such that :**

$$n_1(X) = \frac{X^2 + 3X + 2}{X^2 - 4} \quad , \quad n_2(X) = \frac{X^2 - 1}{X^2 - 3X + 2}$$

[b] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations : $X + y = 7$, $X^2 + y^2 = 25$

---

4 **[a] Find n (X) in the simplest form showing the domain of n , where :**

$$n(X) = \frac{X}{X - 2} \div \frac{X + 3}{X^2 - X - 2}$$

[b] Find in $\mathbb{R}$ the solution set of the equation : $3X^2 - 5X - 4 = 0$

, by using the general rule , rounding the result to two decimal places.

---

5 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations graphically :**

$X + y = 4$, $2X - y = 2$

[b] If set of zeroes of the function f : $f(X) = aX^2 + X + b$ is $\{0 , 1\}$

find the value of each two constants a and b

3 El-Kalyoubia Governorate

Answer the following questions :

1 **Choose the correct answer :**

(1) Twice the number X subtracted by 3 is ....

(a) $X - 3$ (b) $2X + 3$ (c) $2X - 3$ (d) $3 - 2X$

(2) The domain of the function f where $f(X) = \frac{X + 2}{5X}$ is ....

(a) $\mathbb{R} - \{5\}$ (b) $\mathbb{R} - \{-5\}$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{\text{zero}\}$

(3) If $P(A) = 4 P(\acute{A})$, then $P(A) =$ ....

(a) 0.8 (b) 0.6 (c) 0.4 (d) 0.2

(4) If X is a negative number , then the greatest number of the following is ....

(a) $5 - X$ (b) $5 + X$ (c) $\frac{5}{X}$ (d) $5X$

(5) If $2^7 \times 3^7 = 6^k$, then k = ...

(a) 14 (b) 7 (c) 6 (d) 5

(6) If $x^2 - y^2 = 2(x + y)$ where $(x + y) \neq$ zero , then $(x - y) =$ ....

(a) 2 (b) 4 (c) 6 (d) 8

---

2 [a] If $n(x) = \dfrac{x^3 - 8}{x^2 - x - 2} \div \dfrac{x^2 + 2x + 4}{2x^2 - x - 3}$

Find n (x) in its simplest form showing the domain of n

[b] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :

$2x = 1 - y$, $x + 2y = 5$ in $\mathbb{R} \times \mathbb{R}$

---

3 [a] If A , B are two events in a random experiment , P (A) = 0.7 , P (B) = 0.6 and P $(A \cap B) = 0.4$

Find : (1) P $(A \cup B)$ (2) P (A – B)

[b] Find the solution set of the two equations : $y - x = 3$, $x^2 + y^2 - xy = 13$ in $\mathbb{R}^2$

---

4 [a] If $n(x) = \dfrac{x^2 + x}{x^2 - 1} - \dfrac{x - 5}{x^2 - 6x + 5}$ Find n (x) in its simplest form , showing the domain of n

[b] By using the formula , find in $\mathbb{R}$ the solution set of the equation : $x^2 - 2x - 6 = 0$

(Approximate to the nearest one decimal)

---

5 [a] If $n_1(x) = \dfrac{x^2 + 2x}{x^2 + 4x + 4}$, $n_2(x) = \dfrac{2x}{2x + 4}$, **prove that :** $n_1 = n_2$

[b] If $n(x) = \dfrac{x - 2}{x + 1}$

Find : (1) The domain of n^{-1} (2) $n^{-1}(3)$

4 El-Sharkia Governorate

Answer the following questions : (Calculator is allowed)

1 **Choose the correct answer from those given :**

(1) In the experiment of rolling a regular die once , the probability of appearance of an even number on the upper face = ...

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{5}{6}$

(2) The set of zeroes of the function $f : f(X) = X^2 + 1$ is ....

(a) $\{1\}$ (b) $\{-1\}$ (c) $\{-1, 1\}$ (d) $\varnothing$

(3) The point of intersection of the two straight lines $X + 2 = 0$ and $y - 3 = 0$ is ....

(a) $(-2, -3)$ (b) $(-2, 3)$ (c) $(2, -3)$ (d) $(2, 3)$

(4) If $2^5 \times 3^5 = m \times 6^4$, then m = ...

(a) 1 (b) 2 (c) 3 (d) 6

(5) The domain of the multiplicative inverse of the algebraic fraction $\frac{X+2}{X+5}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{-5\}$ (c) $\mathbb{R} - \{-2\}$ (d) $\mathbb{R} - \{-2, -5\}$

(6) If $(7^{a-2}, 3) = (1, b+5)$, then a + b = ...

(a) -1 (b) zero (c) 1 (d) 2

---

2 **[a] By using the general rule solve in $\mathbb{R}$ the equation :** $X(X-1) = 4$ taking $\sqrt{17} \approx 4.12$

[b] If A and B are two events in a sample space for a random experiment, and if

$P(A) = 0.8$, $P(B) = 0.7$ and $P(A \cap B) = 0.6$

Find : (1) The probability of non occurrence of the event A

(2) The probability of occurrence one of the two events at least.

---

3 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :** $X - y = 4$, $3X + 2y = 7$

[b] If $n_1(X) = \frac{X^2 - 3X + 9}{X^3 + 27}$, $n_2(X) = \frac{2}{2X + 6}$ **Prove that :** $n_1 = n_2$

---

4 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :** $X - y = 1$, $X^2 - y^2 = 5$

[b] Find n (X) in the simplest form showing the domain :

$n(X) = \frac{X^2 + 2X + 4}{X^3 - 8} - \frac{9 - X^2}{X^2 + X - 6}$ **and find :** n (58)

---

5 **[a]** If $n(X) = \frac{X^3 - X}{X^2 - 2X + 1} \times \frac{2X - 2}{X^2 + X}$

Find : n (X) in the simplest form showing the domain.

[b] If the set of zeroes of the function f where $f(X) = \frac{aX^2 - 6X + 8}{bX - 4}$ is $\{4\}$ and its domain is $\mathbb{R} - \{2\}$, **then find :** a, b

5 El-Monofia Governorate

Answer the following questions :

1 Choose the correct answer :

(1) If $a < \sqrt{3} < b$, then (a , b) is ....

(a) $(0 , 1)$ (b) $(2.5 , 3.5)$ (c) $(1 , 2)$ (d) $(2 , 3)$

(2) If the curve of the quadratic function does not intersect the X-axis at any point , then the number of solutions of the equation $f(X) = 0$ in $\mathbb{R}$ is ....

(a) zero (b) one solution. (c) two solutions. (d) an infinite number.

(3) If $2^8 \times 3^8 = X \times 6^8$, then $X =$ ....

(a) 2 (b) 3 (c) 6 (d) 1

(4) The set of zeroes of the function $f : f(X) = \frac{X^2 - 9}{X - 3}$ is ....

(a) $\{3\}$ (b) $\{-3\}$ (c) $\{3 , -3\}$ (d) $\varnothing$

(5) If $f(X) = 6X^2 + 3X(1 - 2X)$ is a polynomial function , then its degree is ....

(a) first. (b) second. (c) third. (d) fourth.

(6) If A and B are two mutually exclusive events of random experiment then :
$P(A \cap B) =$ ....

(a) $P(A \cup B)$ (b) $P(A) + P(B)$ (c) $\varnothing$ (d) zero

2 [a] If $(2a + b , 3) = (18 , a - b)$:

Find the value of a and b (Indicating the steps of the solution).

[b] By using the general formula , find in $\mathbb{R}$ the solution set for the following equation :

$(X - 4)(X - 2) = 1$ (knowing that : $\sqrt{2} \approx 1.41$)

3 [a] If the domain of the function n where : $n(X) = \frac{4}{X + a} + \frac{b}{2X}$

is $\mathbb{R} - \{0 , -5\}$ and $n(3) = 1$, find the values of a and b

[b] Find n (X) in the simplest form showing the domain where :

$$n(X) = \frac{X^2 + 4X + 3}{X - 1} \div \frac{X^2 + 3X}{X^2 - X}$$

4 [a] **Find n (X) in the simplest form showing the domain where :**

$n(X) = \frac{X^2 + X + 1}{X^4 - X} + \frac{X + 3}{3 - 2X - X^2}$ and if $n(a) = -2$, find the value of a

[b] A right angled triangle in which the length of one of the sides of right angled is 5 cm. and its perimeter is 30 cm. Find the area of the triangle.
(Indicating the steps of the solution).

---

5 [a] If $n_1(X) = \dfrac{X^2 - 4}{X^2 + X - 6}$, $n_2(X) = \dfrac{X^3 - X^2 - 6X}{X^3 - 9X}$

Prove that : $n_1(X) = n_2(X)$ for all values of X which belong to the common domain and find this domain.

[b] If A and B are two events of the sample space of a random experiment
$P(A) = \frac{5}{9}$, $P(B) = \frac{2}{9}$, $P(A \cap B) = \frac{1}{9}$

Find : (1) $P(A \cup B)$

(2) The probability of non occurrence any of the two events.

(3) The probability of occurrence of event A only.

6 El-Gharbia Governorate

Answer the following questions :

1 **Choose the correct answer from those given :**

(1) If the solution set of the equation $X^2 - aX + 4 = 0$ is $\{-2\}$, then a = ...

(a) -2 (b) -4 (c) 2 (d) 4

(2) If $n(X) = \dfrac{X+2}{X-5}$, then the domain of n^{-1} is ....

(a) $\{2 , -5\}$ (b) $\{-2 , 5\}$ (c) $\mathbb{R} - \{-2 , 5\}$ (d) $\mathbb{R} - \{2 , -5\}$

(3) If A and B are two mutually exclusive events of a random experiment , if $P(A) = \frac{1}{3}$, $P(A \cup B) = \frac{7}{12}$, then P (B) = ...

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) 1

(4) The set of zeroes of the function $f : f(X) = \dfrac{X^2 - X - 2}{X^2 + 4}$ is ....

(a) $\{2 , -2\}$ (b) $\{-2 , -1\}$ (c) $\{2 , -1\}$ (d) $\{1 , -1\}$

(5) The point of intersection of the two straight lines : y = 2 , $X + y = 6$ is ....

(a) (4 , 2) (b) (2 , 4) (c) (2 , 2) (d) (4 , 4)

(6) If the curve of the function $f : f(X) = X^2 - X + c$ passing through the point (2 , 1) , then c = ...

(a) 2 (b) 1 (c) -2 (d) -1

2 [a] Find in $\mathbb{R}$ the solution set of the following equation , using the general rule , rounding the results to two decimal places : $X(X-1)=4$

[b] **Find :** $n(X)=\frac{X^3-8}{X^2+X-6}\times\frac{X+3}{X^2+2X+4}$ in the simplest form showing the domain.

---

3 [a] **Find in $\mathbb{R}\times\mathbb{R}$ the solution set of the two equations :** $y-X=2$ and $X^2+Xy-4=0$

[b] **Find n (X) in the simplest form , showing the domain where :** $n(X)=\frac{3}{X+1}+\frac{2X+1}{1-X^2}$

---

4 [a] Draw the graphical representation of the function $f(X)=X^2-2X-3$ in the interval $[-2\ ,4]$ and from the drawing , find the solution set of the equation $X^2-2X-3=0$

[b] **Find n (X) in the simplest form , showing the domain of n where :**

$n(X)=\frac{X^2-2X+1}{X^3-1}\div\frac{X-1}{X^2+X+1}$

---

5 [a] If $n(X)=\frac{X^2-2X}{(X-2)(X^2+2)}$

(1) Find $n^{-1}(X)$ in the simplest form and determine the domain of n^{-1}

(2) If $n^{-1}(X)=3$ what is the value of X ?

[b] If A and B are two events in the sample space of a random experiment and if

$P(A)=0.7$, $P(B)=0.6$ and $P(A\cap B)=0.4$

Find : (1) $P(A\cup B)$

(2) Probability occurrence of one event without the other.

7 El-Dakahlia Governorate

Answer the following questions : (Calculators are permitted)

1 [a] **Choose the correct answer from the given answers :**

(1) The point of intersection of the two straight lines : $X+2=0$ and $y=X$ is ....

(a) (2 , 2) (b) (2 , 0) (c) (– 2 , – 2) (d) (0 , 0)

(2) If $n(X)=\frac{X+1}{X-2}$ is an algebraic fraction , then the domain in which the fraction has multiplicative inverse is ....

(a) $\mathbb{R}-\{2\}$ (b) $\mathbb{R}-\{-1\ ,2\}$ (c) $\mathbb{R}-\{-1\}$ (d) $\{-1\ ,2\}$

(3) If there is only one solution for the equation :

$x + 2y = 1$ and $2x + ky = 2$ in $\mathbb{R} \times \mathbb{R}$, then k cannot equal ....

(a) 2 (b) 4 (c) -2 (d) -4

[b] Find in $\mathbb{R}$ the solution set of the equation $x(x-3) = -1$, using the general formula (approximating the results to the nearest tenth)

---

2 [a] **Choose the correct answer from the given answers :**

(1) If the curve of the quadratic function f passes through the points $(2, 0)$, $(-3, 0)$ and $(0, -6)$, then the solution set of the equation $f(x) = 0$ in $\mathbb{R}$ is ....

(a) $\{-2, 3\}$ (b) $\{3, 2\}$ (c) $\{2, -3\}$ (d) $\{-3, -6\}$

(2) The simplest form of the function n : $n(x) = \frac{3-x}{x-3}$ such that $x \in \mathbb{R} - \{3\}$ is ....

(a) 1 (b) -1 (c) 3 (d) -3

(3) If A is an event of random experiment , then P (A) = ...

(a) 1 (b) -1 (c) $1 - P(A)$ (d) $P(A) - 1$

[b] If $(a, 2b)$ is a solution for the equations $3x - y = 5$ and $x + y = -1$, find the value of a and b

---

3 [a] n_1 , n_2 are two algebraic fractions such that : $n_1(x) = \frac{x^2-4}{x^2+x-6}$ and $n_2(x) = \frac{x^2-x-6}{x^2-9}$

Prove that : $n_1(x) = n_2(x)$ for all values of x which belong to the common domain and find this domain.

[b] **Find in $\mathbb{R} \times \mathbb{R}$ the solution set of pair of equations :** $x + y = 3$ and $x^2 + xy = 6$

---

4 [a] If $n(x) = \frac{x^2+3x}{x^2+2x-3} - \frac{x-2}{x^2-3x+2}$

Find n (x) in simplest form showing the domain of n

[b] **Find n (x) in simplest form showing the domain of n , such that :**

$n(x) = \frac{x^3-x^2-2x}{x^2-5x+6} \times \frac{x^2+2x-15}{x^3+6x^2+5x}$, then find n (7) , n (3) if possible.

---

5 [a] If $f_1(x) = \frac{x-a}{x+b}$, and the set of zeroes of f_1 is $\{5\}$, and the domain of f_1 is $\mathbb{R} - \{3\}$, then find the values of a and b

If $f_2(x) = \frac{x-1}{x-3}$, then find $f_1(x) + f_2(x)$ in the simplest form.

[b] If A and B are two events in a sample space of a random experiment and $P(A) = 0.7$, $P(B) = 0.6$ and $P(A \cap B) = 0.4$, **then find :**

(1) $P(A \cup B)$

(2) The probability of occurrence of one of the two events but not the other.

8 Ismailia Governorate

Answer the following questions : *(Calculators are permitted)*

1 Choose the correct answer from those given answers :

(1) If the age of a man now is X year , then his age after 5 years from now is .... years.

(a) $X - 5$ (b) $5 - X$ (c) $5X$ (d) $X + 5$

(2) The set of zero is of f where $f(X) = X(X^2 - 2X + 1)$ is ....

(a) $\{0 , 1\}$ (b) $\{0 , -1\}$ (c) $\{-1 , 1\}$ (d) $\{0 , 1 , -1\}$

(3) If $(5 , X - 4) = (y , 3)$, then $X + y =$ ....

(a) 25 (b) 12 (c) 8 (d) 6

(4) Number of solutions of the two equations : $X + y = 2$, $y - 3 = 0$ together is ....

(a) 3 (b) 2 (c) 1 (d) zero

(5) If A and B are two mutually exclusive events , then $P(A - B) =$ ....

(a) zero (b) $P(A)$ (c) $P(B)$ (d) $P(A \cup B)$

(6) If the curve of the function f where $f(X) = X^2 - a$ passes through the point $(1 , 0)$, then $a =$ ....

(a) -2 (b) -1 (c) zero (d) 1

2 [a] Find the solution set of the following equation in $\mathbb{R}$:

$X(X - 2) = 4$ (knowing that : $\sqrt{5} \simeq 2.2$)

[b] If $n(X) = \dfrac{X^2 - 2X}{X^2 - 5X + 6}$

Find : $n^{-1}(X)$ in the simplest form showing the domain of n^{-1}

3 [a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations (algebraically) :

$X + y = 5$, $X^2 + Xy = 15$

[b] Find $n(X)$ in the simplest form where : $n(X) = \dfrac{X}{X - 4} - \dfrac{4X + 16}{X^2 - 16}$

4 [a] A classroom consists of 40 students , 30 of them succeeded in math. 24 in science and 20 in both math. and science. If a student is chosen randomly.

Find the probability that this student is :

(1) fail in math. (2) succeeded in math. or science

[b] **Find n (X) in the simplest form showing the domain of n :**

$$n(X) = \frac{X^2 - X - 2}{X^2 - 1} \div \frac{X - 5}{X^2 - 6X + 5}$$

---

5 [a] **Find n (X) in the simplest form where :** $n(X) = \frac{X^2 + 2X + 4}{X^3 - 8} + \frac{1}{X + 2}$

[b] **Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the following two equations (graphically) :**

$y = 3X - 1$, $X - y + 1 = \text{zero}$

9 Suez Governorate

Answer the following questions : *(Calculators are permitted)*

1 **Choose the correct answer from those given :**

(1) The set of zeroes of f where $f(X) = (X - 1)^2 (X + 2)$ is ....

(a) $\{1 , -2\}$ (b) $\{-1 , 2\}$ (c) $\{-1 , -2\}$ (d) $\{1 , 2\}$

(2) If $X - y = 2$, $X^2 - y^2 = 10$, then $X + y =$ ....

(a) -5 (b) 2 (c) -2 (d) 5

(3) If $A \subset S$ of a random experiment , $P(A) = P(\acute{A})$, then $P(A) =$ ....

(a) zero (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

(4) If X is a negative number , then the greatest number is ....

(a) $3 + X$ (b) $3 - X$ (c) $3X$ (d) $\frac{3}{X}$

(5) If $X = 3$ belongs to the solution set of the equation : $X^2 - aX - 6 = 0$, then a = ...

(a) 3 (b) 2 (c) 1 (d) -1

(6) The function f where $f(X) = \frac{X - 3}{X - 4}$ has additive inverse in the domain ....

(a) $\mathbb{R} - \{3\}$ (b) $\mathbb{R} - \{4\}$ (c) $\mathbb{R} - \{-4\}$ (d) $\mathbb{R} - \{-3\}$

2 **[a] Find the solution set in $\mathbb{R} \times \mathbb{R}$:** $2x - y = 7$, $3x + y = 8$

(Explain your answer showing the steps solution)

[b] Find n (x) in the simplest form showing the domain of n where :

$n(x) = \frac{x}{x+1} + \frac{x^2}{x^3 + x^2}$, then calculate n (3)

---

3 **[a] Find in $\mathbb{R} \times \mathbb{R}$ algebraically the solution set of the two equations :**

$x - 1 = 0$, $x^2 + y^2 = 10$

[b] If the fraction $\frac{x+2}{x^2-4}$ is the multiplicative inverse of $\frac{x-2}{h}$ where $x \notin \{2, -2\}$,

then calculate h

---

4 **[a] Find in $\mathbb{R}$ the solution set for the following equations by using the formula in :**

$x^2 - 3x + 1 = 0$, knowing that $\sqrt{5} = 2.24$

[b] If $n_1(x) = \frac{3x}{3x+3}$, $n_2(x) = \frac{x^2 + x}{x^2 + 2x + 1}$ **Prove that :** $n_1 = n_2$

---

5 **[a] Find n (x) in the simplest form showing the domain of n where :**

$n(x) = \frac{x^2 + 2x + 1}{2x - 8} - \frac{x - 4}{x + 1}$

[b] If A and B are two events from the sample of a random experiment and

$P(A) = 0.6$, $P(B) = 0.3$, $P(A \cap B) = 0.5$

Find : (1) $P(A \cup B)$ (2) $P(B')$

10 Port Said Governorate

Answer the following questions :

1 **Choose the correct answer from those given :**

(1) If the two equations : $x + 3y = 4$, $x + ay = 7$ represent two parallel straight lines ,

then a = ...

(a) $-\frac{1}{3}$ (b) -3 (c) 3 (d) 1

(2) The domain of the multiplicative inverse of the fraction : $\frac{x-2}{x^3+27}$ is ....

(a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-3, 2\}$ (c) $\mathbb{R} - \{2, -3, 3\}$ (d) $\mathbb{R} - \{3, -3\}$

(3) If $x^2 - y^2 = 2(x + y)$ such that : $x + y \neq 0$, then $x - y =$ ....

(a) 2 (b) 4 (c) 6 (d) 8

(4) If a die is tossed once , then the probability of appearance of an odd number equals ....

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) 1 (d) 3

(5) The degree of the equation : $3x + 4y + xy = 5$ is ....

(a) zero. (b) first. (c) second. (d) third.

(6) If $2x = 1$, then $\frac{1}{5}x =$ ....

(a) $\frac{2}{5}$ (b) $\frac{1}{5}$ (c) $\frac{1}{2}$ (d) $\frac{1}{10}$

---

2 **[a] Solve in $\mathbb{R}$ the equation :** $2x(x - 5) = 1$ approximate to the nearest one decimal.

[b] Find the common domain of $n_1(x)$, $n_2(x)$ to be equal such that :

$$n_1(x) = \frac{x^2 + 9x + 20}{x^2 - 16} \quad , \quad n_2(x) = \frac{x^2 + 5x}{x^2 - 4x}$$

---

3 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :**

$$x - 2y = 0 \quad , \quad x^2 - y^2 = 3$$

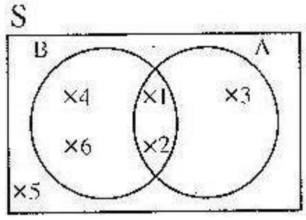
[b] If $n(x) = \frac{x + 3}{x^2 + 5x - 14} \div \frac{x^2 + 3x}{2x + 14}$

Find : $n(x)$ in its simplest form , showing the domain of n

---

4 **[a] Find n in its simplest form , showing its domain where :** $n(x) = \frac{x^2 + x}{x^2 - 1} + \frac{x - 5}{x^2 - 6x + 5}$

[b] Use the opposite Venn diagram to calculate the probability of :



(1) Non occurrence of the event A

(2) The occurrence of the event B only.

(3) Occurrence of A or B

---

5 **[a]** If $n(x) = \frac{x^2 - 2x}{(x - 2)(x + 2)}$

(1) **Find :** $n^{-1}(x)$ (2) If $n^{-1}(x) = 3$ what is the value of x ?

[b] Two number , if three times a number is added to twice a second number the sum is 13 and if the first number is added to three times the second number the sum is 16 , find the two number.

11 Damietta Governorate

Answer the following questions : (Calculators are permitted)

1 Choose the correct answer from the given ones :

(1) The solution set of the equation : $a X^2 + b X + c = 0$, $a \neq 0$ graphically is the set of X coordinates of the points of intersection of the curve of the function $f : f(X) = a X^2 + b X + c$ with the ....

(a) y-axis (b) X-axis (c) symmetric line (d) straight line $y = 2$

(2) If $a b = 12$, $b c = 20$, $a c = 15$, $a \in \mathbb{R}^+$, $b \in \mathbb{R}^+$, $c \in \mathbb{R}^+$, then $a b c =$ ....

(a) 360 (b) 3600 (c) 60 (d) 36

(3) If the algebraic fraction $\frac{X - a}{X + 5}$ have a multiplicative inverse which is $\frac{X + 5}{X + 3}$, then $a =$ ....

(a) 3 (b) -5 (c) -3 (d) 5

(4) $\sqrt{(-2)^4 + 3^2} =$ .... $+ 3$

(a) 2^2 (b) 2 (c) -2 (d) $(-2)^2$

(5) If $P(A) = P(\acute{A})$, then $P(A) =$ ....

(a) $\frac{1}{2}$ (b) 1 (c) $\frac{3}{4}$ (d) 0

(6) $X^3 - 1 =$ ....

(a) $(X^2 - 1)(X + 1)$ (b) $(X - 1)(X^2 + 2X + 1)$

(c) $(X - 1)(X^2 + X + 1)$ (d) $(X - 1)(X^2 - 2X - 1)$

---

2 [a] Find : $n(X) = \frac{X - 3}{X^2 - 7X + 12} - \frac{4}{X^2 - 4X}$ in the simplest from showing the domain of n

[b] Find the value of a and b , knowing that : $\{(3 , -1)\}$ is the solution set of the two equations : $a X + b y - 5 = 0$, $3 a X + b y = 17$

---

3 [a] Find in $\mathbb{R}$ the solution set for the equation $X(X - 1) = 4$ using the general rule to the nearest hundredth.

[b] Find the common domain of f_1 , f_2 to be equal such that :

$f_1(X) = \frac{X^2 + X - 12}{X^2 + 5X + 4}$, $f_2(X) = \frac{X^2 - 2X - 3}{X^2 + 2X + 1}$

4 [a] Two acute angles in a right-angled triangle the difference between their measures is 50°

Find the measure of each angle.

[b] Find n (X) in the simplest form showing the domain :

$$n(X) = \frac{X^2 - 3X + 2}{X^2 - 1} \div \frac{3X - 15}{X^2 - 4X - 5}$$

---

5 [a] If A and B are two events from a sample space of a random experiment and

P (A) = 0.4 , P (B) = 0.5 , P (A ⋃ B) = 0.7

Find : (1) P (A ⋂ B) (2) P (B – A)

[b] If $n(X) = \dfrac{X + \frac{1}{X}}{4X + \frac{4}{X}}$ Find n (X) in the simplest form showing the domain.

12 Kafr El-Sheikh Governorate

Answer the following questions : (Calculator is allowed)

1 **[a] Choose the correct answer from those given :**

(1) If $X = y + 1$, $(X - y)^2 + y = 3$, then y = ...

(a) zero (b) 1 (c) 2 (d) 3

(2) If a b = 3 , a b^2 = 12 , then b = ...

(a) 4 (b) 2 (c) – 2 (d) ± 2

(3) If $n(X) = \dfrac{X - 1}{X - 2}$, then the domain of n^{-1} = ...

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{1\}$ (c) $\mathbb{R} - \{2\}$ (d) $\mathbb{R} - \{1, 2\}$

[b] Solve in $\mathbb{R} \times \mathbb{R}$ the two simultaneous equations :

$X - y = 1$, $X^2 + y^2 = 25$

---

2 **[a] Choose the correct answer from those given :**

(1) The probability of the impossible event equals ....

(a) ∅ (b) zero (c) 1 (d) – 1

(2) If the solution set of the equation : $X^2 + mX + 9 = 0$ is $\{-3\}$, then m = ...

(a) 5 (b) 6 (c) ± 6 (d) zero

(3) If the two equations : $X + 3y = 6$, $2X + ky = 12$ have an infinite number of solution in $\mathbb{R} \times \mathbb{R}$, then k = ...

(a) 2 (b) 6 (c) 3 (d) 1

[b] Two acute angles in a right-angled triangle the difference between their measures is 50°
Find the measure of each angle.

---

3 [a] **Solve in $\mathbb{R}$ using the (general rule) the equation :** $3x^2 = 5x + 4$ approximating the result to the nearest two decimals.

[b] **Find n (x) in the simplest form showing the domain of n where :**

$$n(x) = \frac{3}{x+1} + \frac{2x+1}{1-x^2}$$

---

4 [a] If A , B are two events from a sample space of random experiment , and

$P(B) = \frac{1}{12}$, $P(A \cup B) = \frac{1}{3}$ **, then find P (A) if :**

(1) A and B are two mutually exclusive events. (2) $B \subset A$

[b] If $n_1(x) = \frac{x^2}{x^3 - x^2}$, $n_2(x) = \frac{x^3 + x^2 + x}{x^4 - x}$ **Prove that :** $n_1 = n_2$

---

5 [a] If $n(x) = \frac{x^2 - 5x}{(x-5)(x^2+1)}$

(1) Find $n^{-1}(x)$ and identify the domain of n^{-1}

(2) If $n^{-1}(x) = 2$, find the value of x

[b] If $n(x) = \frac{x^2 - 3x}{x^2 - 9} \div \frac{2x}{x+3}$

Find n (x) in the simplest form showing the domain of n

13 El-Beheira Governorate

Answer the following questions : (Calculator is allowed)

1 **Choose the correct answer from the given ones :**

(1) If $f(x) = 2x$, then $f(1) - f(-1) =$ ....

(a) zero (b) 4 (c) 2 (d) – 2

(2) The two straight lines : $x + 5y = 1$, $x + 5y - 8 = 0$ are ....

(a) parallel. (b) coincide.
(c) intersect and non perpendicular. (d) perpendicular.

(3) If $n(X^2) = 9$, then $n(X) =$ ....

(a) 81 (b) 3 (c) ± 3 (d) – 3

(4) If $n(X) = \frac{X-2}{X^2 - X - 6}$, then the domain of n^{-1} is ....

(a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-2, 3\}$ (c) $\mathbb{R} - \{-2, 2\}$ (d) $\mathbb{R} - \{-2, 2, 3\}$

(5) The degree of the equation : $3X + 4y + Xy = 5$ is ....

(a) zero. (b) first. (c) second. (d) third.

(6) A card is drawn randomly from 20 identical cards numbered from 1 to 20, then the probability that the number of the drawn card multiple of 7 is ....

(a) 10 % (b) 15 % (c) 20 % (d) 25 %

---

2 **[a] Solve in $\mathbb{R}$ the equation :** $3X^2 = 5X + 4$ approximating the result to the nearest two decimals.

[b] Simplify the function n (X) where :

$n(X) = \frac{3X}{X^2 - 2X} - \frac{12}{X^2 - 4}$ showing the domain of **n**

---

3 [a] If $f(X) = \frac{X^2 - 9}{X + b}$, $f(4) = 1$ **Find :** b

[b] If A and B are two events in a random experiment

, $P(A) = 0.7$, $P(B) = 0.6$ and $P(A \cap B) = 0.4$

Find the probability of :

(1) Non occurrence of the event A

(2) Occurrence of one of the events but not the other.

---

4 [a] The sum of two rational numbers is 12, and three times the smallest number exceeds than twice the greatest number by one Find the two numbers.

[b] If $n_1(X) = \frac{X^2}{X^3 - X^2}$, $n_2(X) = \frac{X^3 + X^2 + X}{X^4 - X}$, **then prove that :** $n_1 = n_2$

---

5 **[a] Solve in $\mathbb{R} \times \mathbb{R}$ the two equations :** $X - y = 1$, $X^2 + y^2 = 25$

[b] If $f(X) = \frac{X^2 - 49}{X^3 - 8} \div \frac{X + 7}{X - 2}$

Find : $f(X)$ in its simplest form showing the domain of f

14 El-Fayoum Governorate

Answer the following questions : (Calculators are permitted)

1 Choose the correct answer from the given ones :

(1) $\left(2\sqrt{2}\right)^4 = \dots\dots$

(a) 8 (b) 16 (c) 32 (d) 64

(2) If A and B are mutually exclusive events from the sample space of a random experiment , then $P(A \cap B) = \dots\dots$

(a) 1 (b) zero (c) $\frac{1}{2}$ (d) -1

(3) If $X = 1$ is the solution of the equation : $X^2 + m X + 4 = 0$, then $m = \dots\dots$

(a) 1 (b) -1 (c) zero (d) -5

(4) If $2 X^2 = 5$, then $6 X^2 = \dots\dots$

(a) 5 (b) 10 (c) 15 (d) 20

(5) If $n(X) = \frac{X}{X-1}$, then the domain of $n^{-1} = \dots\dots$

(a) $\mathbb{R} - \{0\}$ (b) $\mathbb{R} - \{1\}$ (c) $\mathbb{R} - \{0, 1\}$ (d) $\mathbb{R} - \{-1\}$

(6) The sum of two consecutive integers is 17 , then the smaller number of them is $\dots\dots$

(a) 8 (b) 9 (c) 17 (d) 72

---

2 [a] If $n(X) = \frac{X^2 + X}{X^2 - X - 2} - \frac{2X + 4}{X^2 - 4}$, find $n(X)$ in the simplest form showing the domain of n

[b] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :

$y = X + 1$, $X^2 + y^2 = 13$

---

3 [a] By using the general rule find in $\mathbb{R}$ the solution set of the equation :

$X^2 - 5X + 3 = 0$, approximating the result to the nearest one decimal digit.

[b] Find $n(X)$ in the simplest form showing the domain of n where :

$n(X) = \frac{X^3 - 1}{X^2 - 2X + 1} \div \frac{X^2 + X + 1}{2X - 2}$

---

4 [a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations graphically :

$y = X + 1$, $2X + y = 7$

[b] Find the set of zeroes of the function f : $f(X) = \frac{X - 1}{X + 1}$, then find $f^{-1}(2)$

5 **[a] Find the common domain of n_1 and n_2 to be equal such that :**

$$n_1(X) = \frac{X^2 + 2X}{X^2 + 3X + 2} \quad , \quad n_2(X) = \frac{X^2 - X}{X^2 - 1}$$

[b] A bag contains 10 identical cards numbered from 1 to 10 , one card of them is drawn randomly , calculate the probability that the number on the drawn card is :

(1) A prime number. (2) A number divisible by 5

15 Beni Suef Governorate

Answer the following questions : (Calculator is allowed)

1 **Choose the correct answer from those given :**

(1) The probability of the impossible event equals ....

(a) $\varnothing$ (b) 1 (c) zero (d) -1

(2) If $2^X = 8$, then $X =$ ....

(a) zero (b) 1 (c) 2 (d) 3

(3) If the two straight lines which represent the two equations :

$X + 2y = 4$, $2X + ky = 11$ are parallel , then $k =$ ....

(a) 4 (b) 1 (c) -1 (d) -4

(4) If a is a negative number , then the greatest number is ....

(a) $3 + a$ (b) $3 - a$ (c) $3a$ (d) $\frac{3}{a}$

(5) The solution set of the equation : $X^2 + 1 = 0$ in $\mathbb{R}$ is ....

(a) $\{1\}$ (b) $\{1 , -1\}$ (c) $\{-1\}$ (d) $\varnothing$

(6) If $n(X) = \frac{X - 1}{X + 2}$, then $n^{-1}(1)$ is ....

(a) -1 (b) zero (c) 3 (d) undefined.

2 **[a] Find the set of zeroes of the function f : $f(X) = X^3 - X$**

[b] Find in $\mathbb{R}$ the solution set of the following equation by using the general formula :

$X^2 - 5X + 3 = 0$ approximating the result to the nearest one decimal digit.

3 **[a] Find algebraically in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :**

$X + y = 4$, $2X - y = 2$

[b] If A and B are two events from a sample space of a random experiment , $P(A) = 0.6$, $P(B) = 0.5$ and $P(A \cap B) = 0.3$

Find : (1) $P(A - B)$ (2) $P(A \cup B)$

4 [a] If $n_1(x) = \dfrac{x^2 - 2x + 4}{x^3 + 8}$, $n_2(x) = \dfrac{3}{3x + 6}$

Prove that : $n_1 = n_2$

[b] **Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :**

$x - 2 = 0$, $x^2 + xy + y^2 = 7$

---

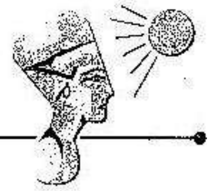
5 [a] Find $n(x) = \dfrac{x^2 - 3x + 2}{x^2 - 1} \div \dfrac{3x - 15}{x^2 - 4x - 5}$

in the simplest form showing the domain of n

[b] If the domain of the function $n : n(x) = \dfrac{x - 1}{x^2 - ax + 9}$ is $\mathbb{R} - \{3\}$

, then find the value of a

16 El-Menia Governorate



Answer the following questions : ***(Calculator is allowed)***

1 **Choose the correct answer from those given :**

(1) $(-1)^{37} - (-1)^{36} =$ ....

(a) -2 (b) zero (c) 1 (d) 2

(2) The degree of the function $f : f(x) = 2x^3 + 3x^2 - 5$ is ....

(a) frouth. (b) fifth. (c) third. (d) zero.

(3) If $a + b = 7$, $a^2 - b^2 = 21$, then $a - b =$ ....

(a) -7 (b) 7 (c) -3 (d) 3

(4) The simplest form of the function $f : f(x) = \dfrac{3 - x}{x - 3}$ where $x \neq 3$ is ....

(a) 3 (b) 1 (c) -1 (d) zero

(5) The number of solutions of the two equations :

$x - \frac{1}{2}y = 4$, $2x - y = 1$ in $\mathbb{R}^2$ is ....

(a) one solution . (b) two solutions.

(c) an infinite number. (d) zero.

(6) If a die is tossed once , then the probability of appearance of a number greater than 4 is ....

(a) $\frac{2}{3}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$

---

2 [a] **Find in $\mathbb{R} \times \mathbb{R}$ the solution set of :**

$x + y = \text{zero}$, $5y^2 - 4x^2 = 36$

[b] **Find n (X) in the simplest form and determine the domain of n :**

$$n(X) = \frac{X - 3}{X^2 - 7X + 12} - \frac{4}{X^2 - 4X}$$

---

3 [a] **By using the general formula find in $\mathbb{R}$ the S.S. of :** $X^2 - X - 4 = 0$ where $\sqrt{17} \approx 4.12$

[b] If $n_1(X) = \dfrac{2X}{2X + 4}$, $n_2(X) = \dfrac{X^2 + 2X}{X^2 + 4X + 4}$ **Prove that :** $n_1 = n_2$

---

4 [a] **Find n (X) in the simplest form showing the domain of n :** $n(X) = \dfrac{X^2 + 2X + 1}{2X - 8} \times \dfrac{X - 4}{X + 1}$

[b] If $(-3 , 1)$ is a solution for the two equations $aX + by = 5$, $3aX + by - 17 = 0$

Find : a , b

---

5 [a] If the domain of n : $n(X) = \dfrac{\ell}{X} + \dfrac{9}{X + m}$ is $\mathbb{R} - \{0 , -2\}$, $n(4) = 1$ **Find :** ℓ , m

[b] If S is the sample space of a random experiment where its outcomes are equal , A and B are two events from S , if the number of outcomes that leads to the occurrence of the event A = 13 and the number of all possible outcomes of the random experiment is 24 , $P(A \cup B) = \dfrac{5}{6}$ and $P(B) = \dfrac{5}{12}$

Find :

(1) The probability of occurrence of the event A

(2) The probability of occurrence of the events A and B together.

17 Assiut Governorate

Answer the following questions : *(Calculator is allowed)*

1 **Choose the correct answer :**

(1) The solution set of the two equations : $X = -1$, $y - 1 = 0$ in $\mathbb{R} \times \mathbb{R}$ is ....

(a) $\{(-1 , 1)\}$ (b) $\{(1 , -1)\}$ (c) $\{(-1 , -1)\}$ (d) $\{(1 , 1)\}$

(2) The solution set of the equation : $2X + 4 = 0$ in $\mathbb{N}$ is ....

(a) $\{2\}$ (b) $\{-2\}$ (c) $\{0\}$ (d) $\varnothing$

(3) The domain of the function f where $f(X) = \dfrac{X - 2}{X^2 + 1}$ is ....

(a) $\mathbb{R} - \{-1\}$ (b) $\mathbb{R} - \{1 , -1\}$ (c) $\mathbb{R} - \{1\}$ (d) $\mathbb{R}$

(4) If $A \subset S$, $P(A) = \dfrac{1}{3}$, then $P(A') =$ ....

(a) $\dfrac{1}{3}$ (b) $\dfrac{2}{3}$ (c) $\dfrac{1}{2}$ (d) $\dfrac{3}{2}$

(5) $|-5| =$ ....

(a) -5 (b) $-\dfrac{1}{5}$ (c) 5 (d) $\dfrac{1}{2}$

(6) If A and B are two mutually exclusive events of a random experiment , then $P(A \cap B) =$ ....

(a) $\varnothing$ (b) 1 (c) zero (d) $\frac{1}{2}$

---

2 **[a] Find algabrically the solution set of the two equations :**

$2x - y = 3$, $x + 2y = 4$

[b] Find n (x) in the simplest form showing the domain of n where :

$$n(x) = \frac{x^2 + 2x + 4}{x^3 - 8} + \frac{x^2 + x - 2}{x^2 - 4}$$

---

3 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :**

$x - y = 1$, $x^2 + y^2 = 25$

[b] If $n(x) = \frac{x^2 - 3x + 2}{x^2 - 1} \div \frac{3x - 15}{x^2 - 4x - 5}$

, find n (x) in the simplest form showing the domain of n

---

4 **[a] Find in $\mathbb{R}$ the solution set of the equation :** $3x^2 - 5x - 1 = 0$ approximating the result to the nearest two decimals.

[b] If $n(x) = \frac{x^2 + 3x}{x^3 + 27}$, find $n^{-1}(x)$ in its simplest form showing the domain of n^{-1}

---

5 [a] If $n_1(x) = \frac{x^2}{x^3 - x^2}$, $n_2(x) = \frac{x^3 + x^2 + x}{x^4 - x}$ **Prove that :** $n_1 = n_2$

[b] A bag contains 15 identical balls numbered from 1 to 15 , one ball is chosen randomly , if the event A is getting an odd number and the event B is getting a number divisible by 5

Find :

(1) P (A) (2) P (B) (3) P (A – B)

18 Souhag Governorate

Answer the following questions : *(Calculator is allowed)*

1 **Choose the correct answer :**

(1) The set of zeroes of the function f where $f(x) = \frac{x - 3}{x + 2}$ is ....

(a) {zero} (b) {3} (c) {– 2} (d) {3 , – 2}

(2) If $2^n = 3$, then $8^n =$ ....

(a) 27 (b) 9 (c) 3 (d) 6

(3) If A and B are two mutually exclusive events of a random experiment , then $P(A \cap B) = \ldots\ldots\ldots$

(a) $\varnothing$ (b) 1 (c) 2 (d) zero

(4) If $3^{x} + 3^{x} + 3^{x} = 9$, then $x = \ldots\ldots\ldots$

(a) 4 (b) 2 (c) 1 (d) 9

(5) If the two equations : $x + 3y = 6$, $2x + ky = 12$ have an infinit number of solutions , then $k = \ldots\ldots\ldots$

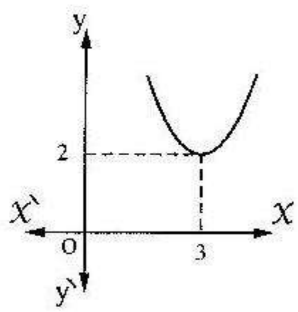
(a) 1 (b) 6 (c) 3 (d) 2

(6) **In the opposite figure :**

The solution set of $f : f(x) = 0$ is ....

(a) $\varnothing$ (b) $\{3\}$

(c) $\{2 , 3\}$ (d) $\{2\}$



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2 [a] **Solve in $\mathbb{R}$ the equation :** $2x^2 - 5x + 1 = 0$ approximating the result to the nearest two decimals.

[b] If $n_1(x) = \dfrac{x^2}{x^3 - x^2}$, $n_2(x) = \dfrac{x^3 + x^2 + x}{x^4 - x}$, **prove that :** $n_1 = n_2$

---

3 [a] **Solve in $\mathbb{R} \times \mathbb{R}$ the two equations :** $x - 2y = 1$, $x^2 - xy = 0$

[b] **Find n (x) in the simplest form showing the domain of n where :** $n(x) = \dfrac{x}{x+1} + \dfrac{2x^2}{x^3 - x}$

---

4 [a] **Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :**

$2x + y = 1$, $x + 2y = 5$

[b] If $n(x) = \dfrac{x^2 - 3x}{x^2 - 9} \div \dfrac{2x}{x+3}$, find $n(x)$ in its simplest form showing the domain of n

---

5 [a] If $n(x) = \dfrac{x - 2}{x + 1}$,

Find : (1) $n^{-1}(x)$ showing the domain of n^{-1} (2) $n^{-1}(3)$

[b] If A and B are two events in a random experiment , $P(A) = 0.7$, $P(B) = 0.6$ and $P(A \cap B) = 0.4$

Find : (1) $P(A \cup B)$ (2) $P(A - B)$

19 Qena Governorate

محافظة قنا

Answer the following questions : *(Calculators are permitted)*

1 Choose the correct answer :

(1) If there are infinite numbers of solutions of the two equations

$x + 4y = 7$, $3x + ky = 21$, then k = ...

(a) 4 (b) 7 (c) 12 (d) 21

(2) One of the solutions for the two equations : $x - y = 2$, $x^2 + y^2 = 20$ is ....

(a) $(-4, 2)$ (b) $(2, -4)$ (c) $(3, 1)$ (d) $(4, 2)$

(3) The set of zeroes of f where $f(x) = x^2 - 2$ is ....

(a) $\{2\}$ (b) $\{-2\}$ (c) $\{\sqrt{2}, -\sqrt{2}\}$ (d) $\varnothing$

(4) The simplest form of $f(x) = \frac{4x^2 - 2x}{2x}$, $x \neq 0$ is ....

(a) $4x^2$ (b) $2x - 1$ (c) $2x$ (d) 2

(5) If A and B are two mutually exclusive events, then $P(A \cap B) =$ ....

(a) $\varnothing$ (b) zero (c) 0.56 (d) 1

(6) If $A \subset B$, then $P(A \cup B) =$ ....

(a) zero (b) P (A) (c) P (B) (d) $P(A \cap B)$

2 [a] **Find in $\mathbb{R} \times \mathbb{R}$ algebraically the solution set of the two equations :**

$2x - y = 3$, $x + 2y = 4$

[b] If $n_1(x) = \frac{2x}{2x + 4}$, $n_2(x) = \frac{x^2 + 2x}{x^2 + 4x + 4}$ **Prove that :** $n_1 = n_2$

3 [a] **Find in $\mathbb{R}$ the solution set of the following equation by using the general rule :**

$3x^2 = 5x - 1$ (Rounding the results to two decimal places)

[b] **Find n (x) in the simplest form showing the domain of n where :**

$n(x) = \frac{x^2 + x + 1}{x} \times \frac{x^2 - x}{x^3 - 1}$

4 [a] **Find in $\mathbb{R} \times \mathbb{R}$ algebraically the solution set of the two equations :**

$x + y = 7$, $xy = 12$

[b] **Find n (x) in the simplest form showing the domain of n where :**

$n(x) = \frac{3x - 4}{x^2 - 5x + 6} + \frac{2x + 6}{x^2 + x - 6}$

5 [a] If $n(X) = \dfrac{X^2 - 2X}{(X-2)(X^2+2)}$

(1) Find $n^{-1}(X)$ and identify the domain.

(2) If $n^{-1}(X) = 3$ what is the value of X ?

[b] If A and B are two events from the sample space of a random experiment and $P(A) = 0.7$, $P(A \cap B) = 0.3$ **Find :** $P(A - B)$

20 Luxor Governorate

محافظة الأقصر

Answer the following questions :

1 **Choose the correct answer :**

(1) The set of zeroes of the function $f : f(X) = X^2 + 3$ is ....

(a) $\{0\}$ (b) $\varnothing$ (c) $\{3\}$ (d) $\{3, -3\}$

(2) $\sqrt{16+9} = 4 +$ ....

(a) 3 (b) 5 (c) 1 (d) 7

(3) If $\grave{A}$ is the complement event of the event A in a sample space of a random experiment , then $P(A) + P(\grave{A}) =$ ....

(a) 2 (b) 1 (c) $\frac{1}{2}$ (d) 3

(4) If $3^X = 1$, then $X =$ ....

(a) 0 (b) $\frac{1}{3}$ (c) 1 (d) 3

(5) The point of intersection of the two straight lines : $y = 2$, $X + y = 6$ is ....

(a) (2 , 4) (b) (2 , 6) (c) (6 , 2) (d) (4 , 2)

(6) If $(5, X - 4) = (y + 2, 3)$, then $X + y =$ ....

(a) 6 (b) 8 (c) 10 (d) 12

---

2 **[a] Find the solution set of the two equations in $\mathbb{R}^2$:** $X - 2y = 0$, $X^2 - y^2 = 3$

[b] If $n(X) = \dfrac{X^2 - 16}{X + 4}$

Find : (1) $n^{-1}(X)$ showing the domain of n^{-1} (2) $n^{-1}(4)$ (3) $n(4)$

---

3 [a] If $n_1(X) = \dfrac{2X}{2X+4}$, $n_2(X) = \dfrac{X^2 + 2X}{X^2 + 4X + 4}$ **Prove that :** $n_1 = n_2$

[b] Using the general rule find in $\mathbb{R}$ the S.S. of the equation :

$3X^2 = 5X - 1$ $\left(\text{given that } \sqrt{13} \approx 3.61\right)$

4 [a] If A , B are two events of the sample space of a random experiment and if
$P(B) = \frac{1}{12}$, $P(A \cup B) = \frac{1}{3}$

Find P (A) in the following cases :

(1) A and B are two mutually exclusive events (2) $B \subset A$

[b] If $n(X) = \frac{X^2 + X}{X^2 - 1} - \frac{5 - X}{X^2 - 6X + 5}$

Find n (X) in the simplest form showing the domain of n.

---

5 [a] If $n(X) = \frac{X^3 - 1}{X^2 - 2X + 1} \times \frac{2X - 2}{X^2 + X + 1}$

Find n (X) in the simplest form showing the domain

[b] Find graphically in $\mathbb{R} \times \mathbb{R}$ the S.S. of the two equations :

$y = X + 4$, $X + y = 4$

21 Aswan Governorate

Answer the following questions : *(Calculators are permitted)*

1 Choose the correct answer from those given :

(1) If $X + y = 5$, then $3X + 3y =$ ....

(a) 5 (b) 3 (c) 8 (d) 15

(2) If $\sqrt{64 + 36} = 8 + X$, then $X =$ ....

(a) 9 (b) 6 (c) 2 (d) 10

(3) The solution set of the two equations : $y - 5 = 0$, $y + X = 0$ in $\mathbb{R} \times \mathbb{R}$ is ....

(a) $\{(-5 , 5)\}$ (b) $(5 , -5)$ (c) $\{(0 , 5)\}$ (d) $(-5 , 5)$

(4) The set of zeroes of the function $f : f(X) = 4$ is ....

(a) $\{-4\}$ (b) $\{\text{zero}\}$ (c) $\varnothing$ (d) $\{2\}$

(5) If the probability that a student succeeded is 95 % , then the probability that he does not succeed is ....

(a) 20 % (b) 5 % (c) 10 % (d) zero

(6) The solution set of the equation : $X^2 - 4X + 4 = 0$ in $\mathbb{R}$ is ....

(a) $\{-2\}$ (b) $\{2\}$ (c) $\{4 , 1\}$ (d) $\varnothing$

---

2 [a] **Find in $\mathbb{R} \times \mathbb{R}$ algebraically the solution set of two equations :**

$X + y = 4$, $2X - y = 2$

[b] If $n(X) = \frac{X - 1}{X + 3}$ find $n^{-1}(X)$ and identify the domain of n^{-1}

3 [a] If $n(x) = \dfrac{x^2 - 3x}{x^2 - 9} \div \dfrac{2x}{x+3}$, **find n (x) in the simplest form showing the domain of n**

[b] Find in $\mathbb{R} \times \mathbb{R}$ algebraically the solution set of the two equations :

$x - 2y = 0$, $x^2 - y^2 = 3$

---

4 [a] If A and B are two events from a sample space of a random experiment and

$P(A) = \dfrac{1}{2}$, $P(B) = \dfrac{1}{3}$

Find P (A ⋃ B) if :

(1) $P(A \cap B) = \dfrac{1}{8}$

(2) A and B are mutually exclusive events.

[b] If $n(x) = \dfrac{x}{x^2 + 2x} + \dfrac{x - 2}{x^2 - 4}$, **find n (x) in the simplest form showing the domain of n**

---

5 **[a] By using the formula find in $\mathbb{R}$ the solution set of the equation**

$3x^2 - 5x + 1 = 0$ rounding the result to two decimal places.

[b] Find the common domain in which the two functions n_1 and n_2 are equal where :

$n_1(x) = \dfrac{x^2 + x - 12}{x^2 + 5x + 4}$, $n_2(x) = \dfrac{x^2 - 2x - 3}{x^2 + 2x + 1}$

22 South Sinai Governorate

Answer the following questions : *(Calculator is permitted)*

1 **Choose the correct answer from those given :**

(1) The number of solutions of the two equations : $x + y = 5$ and $y - 5 = 0$ is ....

(a) zero (b) 1 (c) 2 (d) 3

(2) The point (– 3 , 4) lies in .... quadrant.

(a) fourth (b) third (c) second (d) first

(3) The range of the set of the values : 7 , 3 , 6 , 9 and 5 equals ....

(a) 3 (b) 4 (c) 5 (d) 6

(4) $(-3x) \times (-5y) =$ ....

(a) $15xy$ (b) $8xy$ (c) $-8xy$ (d) $-15xy$

(5) If the fraction $\dfrac{x - a}{x + 3}$ is the multiplicative inverse of $\dfrac{x + 3}{x + 5}$, then a = ...

(a) – 5 (b) – 3 (c) 3 (d) 5

(6) If A and B are two mutually exclusive events, then P (A ∩ B) equals ....

(a) ∅ (b) zero (c) $\frac{1}{2}$ (d) 1

---

2 **Find n (X) in the simplest form showing the domain of n where :**

(1) $n(X) = \frac{X^2 + X}{X^2 - 1} - \frac{X - 5}{X^2 - 6X + 5}$ (2) $n(X) = \frac{X^2 + 2X}{X^3 - 27} \times \frac{X^2 + 3X + 9}{X + 2}$

---

3 [a] **Find in ℝ × ℝ the solution set of the following two equations graphically :**

$y = X + 4$, $y + X = 4$

[b] **By using the formula find in ℝ the solution set of the equation :** $2X^2 - 5X - 1 = 0$ approximating the result to the nearest one decimal.

---

4 [a] **Find in ℝ × ℝ the solution set of the following two equations :**

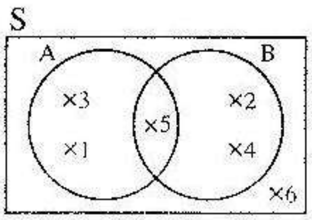
$X - y = 1$, $X^2 - Xy = 0$

[b] **Use the opposite Venn diagram and find :**

(1) P (A ∩ B)

(2) P (A ∪ B)

(3) P (A − B)



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5 [a] If the domain of the function n where $n(X) = \frac{b}{X} + \frac{9}{X + a}$ is ℝ − {0 , 3}

, n (6) = 7 find the values of a , b

[b] If $n_1(X) = \frac{1}{X + 1}$, $n_2(X) = \frac{X^2 - X + 1}{X^3 + 1}$, **then prove that :** $n_1 = n_2$

23 North Sinai Governorate

Answer the following questions : (Calculators are permitted)

1 **Choose the correct answer from those given :**

(1) The multiplicative inverse of $\frac{\sqrt{2}}{3}$ is ....

(a) $\frac{-\sqrt{2}}{3}$ (b) $\frac{3\sqrt{2}}{2}$ (c) $\frac{2\sqrt{3}}{3}$ (d) $\frac{\sqrt{3}}{2}$

(2) The S.S. of the two equations : $X - 2y = 1$, $3X + y = 10$ in ℝ × ℝ is ....

(a) {(5 , 2)} (b) {(2 , 4)} (c) {(1 , 3)} (d) {(3 , 1)}

(3) Twice its square the number $\frac{1}{2}$ is ....

(a) $-\frac{1}{2}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) 1

(4) The domain of the function $f : f(X) = \frac{X-2}{7}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R}-\{2\}$ (c) $\mathbb{R}-\{7\}$ (d) $\mathbb{R}-\{2,7\}$

(5) $X^2 + k X + 9$ is a perfect square if k = ...

(a) 3 (b) -3 (c) ± 3 (d) ± 6

(6) If the probability of failure of a student is 0.4 , then the probability of his success is ....

(a) zero (b) 1 (c) $\frac{2}{5}$ (d) $\frac{3}{5}$

---

2 **[a] Using the general formula , find in $\mathbb{R}$ the solution set of the equation :**

$X^2 - 2X - 6 = 0$

[b] Find n (X) in the simplest form showing the domain of n where :

$$n(X) = \frac{X}{X-4} - \frac{X+4}{X^2-16}$$

---

3 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the S.S. of the following two equations :**

$X - y = 2$, $X^2 - 5y = 4$

[b] If $n(X) = \frac{X^2+3X}{X^2+X-6}$

(1) **Find :** $n^{-1}(X)$ and find the domain of n^{-1} (2) If $n^{-1}(X) = 2$, find value of X

---

4 **[a] Find in $\mathbb{R} \times \mathbb{R}$ the S.S of the following two equations graphically :**

$y = 2X - 3$, $X + 2y = 4$

[b] Find n (X) in the simplest form showing the domain of n where :

$$n(X) = \frac{X^3-8}{X^2-6X+5} \div \frac{X^3+2X^2+4X}{2X^2+X-3}$$

---

5 **[a]** A bag contains 15 balls numbered from 1 to 15 , if a ball is drawn randomly , if the event A is getting an odd number and the event B is getting a prime number

Find : (1) P (A) (2) P (B) (3) P (A – B)

[b] If $n_1(X) = \frac{2X}{2X+4}$, $n_2(X) = \frac{X^2+2X}{X^2+4X+4}$

Prove that : $n_1 = n_2$

24 Matrouh Governorate

Answer the following questions : (Calculator is permitted)

1 Choose the correct answer from those given :

(1) $3^{-2} =$ ....

(a) -9 (b) $\frac{-1}{9}$ (c) $\frac{1}{9}$ (d) 9

(2) If A and B are two mutually exclusive events in a random experiment , then $P(A \cap B) =$ ....

(a) zero (b) $\varnothing$ (c) 1 (d) $\{0, 1\}$

(3) The solution set of the inequality : $x \le 1$ in $\mathbb{N}$ is ....

(a) $\{1\}$ (b) $\{0\}$ (c) $\{0, 1\}$ (d) $\{0, 1, -1, ...\}$

(4) The set of zeroes of f where $f(x) = \frac{x^2 - 9}{x - 2}$ is ....

(a) $\{2\}$ (b) $\mathbb{R} - \{2\}$ (c) $\{3, -3\}$ (d) $\{3, -3, 2\}$

(5) If $n(x) = \frac{x - 7}{x + 3}$, then the domain of n^{-1} is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{-3\}$ (c) $\mathbb{R} - \{-3, 7\}$ (d) $\mathbb{R} - \{7\}$

(6) The point of intersection of the two straight lines : $y = 2$ and $x + y = 6$ is ....

(a) $(2, 6)$ (b) $(2, 4)$ (c) $(4, 2)$ (d) $(6, 2)$

---

2 [a] Find the common domain in which the two functions f_1 and f_2 are equal where :

$$f_1(x) = \frac{x^2 + 3x + 2}{x^2 - 4} \quad , \quad f_2(x) = \frac{x^2 - 1}{x^2 - 3x + 2}$$

[b] Find in $\mathbb{R} \times \mathbb{R}$ the solution set to the following two equations graphically :

$y = x + 4 \quad , \quad x + y = 4$

---

3 [a] Find $f(x)$ in the simplest form , showing the domain of f where :

$$f(x) = \frac{x^2 - x}{x^2 - 1} + \frac{x + 5}{x^2 + 6x + 5}$$

[b] Find in $\mathbb{R}$ the solution set of the equation : $x^2 - 2x - 6 = 0$

approximating the result to the nearest two decimals.

4 **[a] Find n (x) in the simplest form showing the domain of n where :**

$$n(x) = \frac{x^2 - 3x + 2}{x^2 - 1} \div \frac{3x - 5}{x^2 - 4x - 5}$$

[b] Find in $\mathbb{R} \times \mathbb{R}$ the solution set of the two equations :

$y = x - 3$, $x^2 + y^2 = 17$

---

5 **[a] If the set of zeros of the function f where :**

$f(x) = a x^2 + b x + 8$ is $\{2, 4\}$ **Find the value of a and b**

[b] If A and B are two events in a random experiment

, P (A) = 0.8 , P (B) = 0.7 and P (A $\cap$ B) = 0.6

Find : (1) The probability of non occurrence of the event A

(2) The probability of occurrence of at least one of the events.